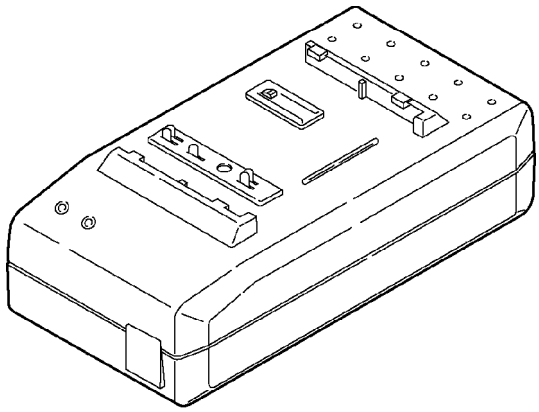
ORDER NO. VMD0112029C8

Service Manual

Battery Charger

VW-BCV1E / VW-BCV1B / VW-BCV1A / VSK0612



SPECIFICATIONS

SPECIFICATIONS

ITEM	SPECIFICATION
POWER	Source: AC 100-240V, 50/60 Hz (Automatic Voltage Adjustment)
	Consumption: Approx. 27W
	Output: DC 8.4 V, 1.4 A (Battery Pack Charging)
DIMENSIONS	72 (W) x 39 (H) x 143 (D) mm
WEIGHT	Approx. 210 g (Without AC Cable)

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Panasonic

1. AC ADAPTOR SCHEMATIC DIAGRAM& CIRCUIT BOARD DIAGRAM

1.1. SCHEMATIC DIAGRAM

1.2. CIRCUIT BOARD DIAGRAM

IMPORTANT SAFETY NOTES:
COMPONENT IDENTIFIED THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING OF THESE COMPONENTS, USE ONLY THE SAME TYPE.
HOT CIRCUIT BE CAREFUL AND USE AN ISOLATION
TRANSFORMER WHEN SERVICING.

1.2.1. MAIN C.B.A. (VEP61267A)

2. CAUTION FOR AC CORD (VJA0940 TYPE)

2.1. Information for Your Safety

IMPORTANT
Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING

To reduce the risk of fire or shock hazard, do not expose this equipment to rain or moisture.

CAUTION

To reduce the risk of fire or shock hazard and annoying interference, use the recommended accessories only.

FOR YOUR SAFETY
DO NOT REMOVE THE OUTER COVER
To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

2.2. Caution for AC Mains Lead

For your safety, please read the following text carefully.
This appliance is supplied with a moulded three-pin mains plug for your safety and convenience.
A 5-ampere fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amperes and it is approved by ASTA or BSI to BS1362
Check for the ASRA mark or the BSI mark on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover, the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local Panasonic Dealer.
If the fitted moulded plug is unsuitable for the socket outlet in your home then the fuse should be removed and the plug cut off and disposed of safety.
There is a danger of severe electrical shock if the cut off plug is inserted into any 13-ampere socket.
If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt, please consult a qualified electrician.

2.2.1. IMPORTANT

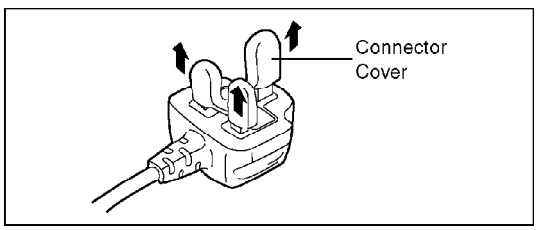
The wires in this mains lead are coloured in accordance with the following code:

Blue	**Neutral**
Brown	**Live**

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.
Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol.

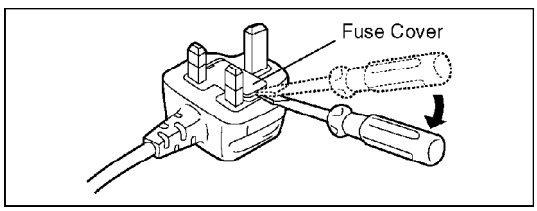
2.2.2. Before use

remove the Connector Cover as follows.

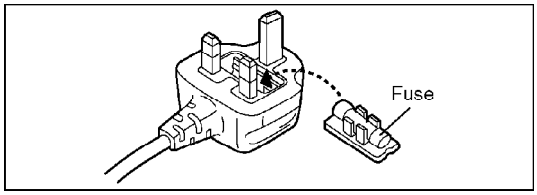


2.2.3. How to replace the Fuse

1. Remove the Fuse Cover with a screwdriver.

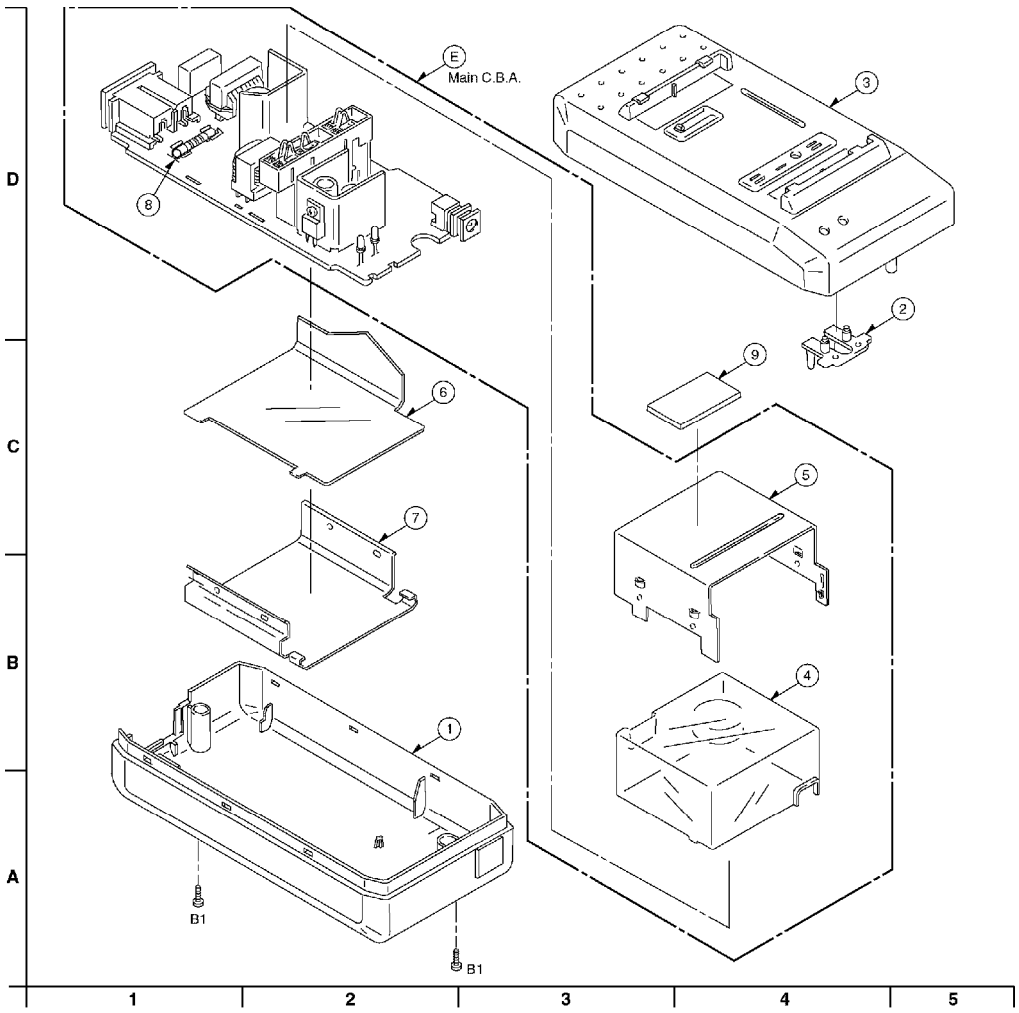


2. Replace the fuse and attach the Fuse cover.

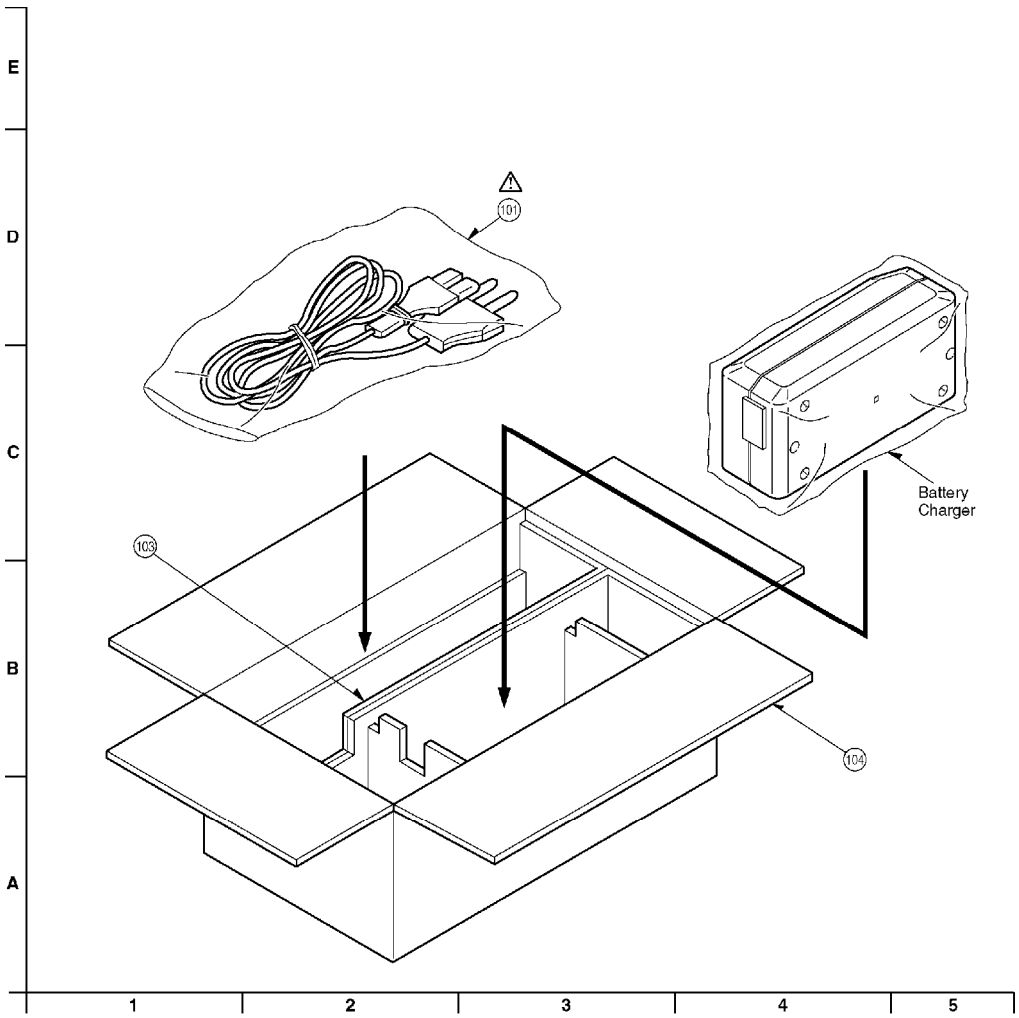


3. EXPLODED VIEWS

3.1. AC ADAPTOR SECTION



3.2. PACKING& ACCESSORIES SECTION



4. REPLACEMENT PARTS LIST

4.1. AC ADAPTOR SECTION PARTS LIST

Note: 1. *Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1 (1)	VKM5821	BOTTOM CASE	1	
2 (1)	VGL0820	LED PANEL LIGHT	1	
3 (1)	VKM5820	TOP CASE	1	
4 (1)	VMZ2873	TOP BARRIER	1	⚠
5 (1)	VSC4847	TOP SHIELD CASE	1	
6 (1)	VMZ2667	BOTTOM BARRIER	1	⚠
7 (1)	VSC4614	BOTTOM SHIELD CASE	1	
8 (1)	K5D202BL0004	FUSE	1	⚠
9 (1)	VMT0974	PROTECT SHEET	1	
B1 (1)	XTB26+10GFZ	SCREW	2	

4.2. PACKING& ACCESSORIES SECTION PARTS LIST

Note: 1. *Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
101 (2)	VJA0664	AC CABLE	1	K2CR2DA00004 VW-BCV1E ⚠
101 (2)	VJA0940	AC CABLE	1	K2CT3DA00003 VW-BCV1B ⚠
101 (2)	VJA0754	AC CABLE	1	K2CJ2DA00002 VW-BCV1A ⚠
103 (2)	VPN5203	PAD	1	
104 (2)	VPG0M54	PACKING CASE	1	

4.3. ELECTRICAL PARTS LIST

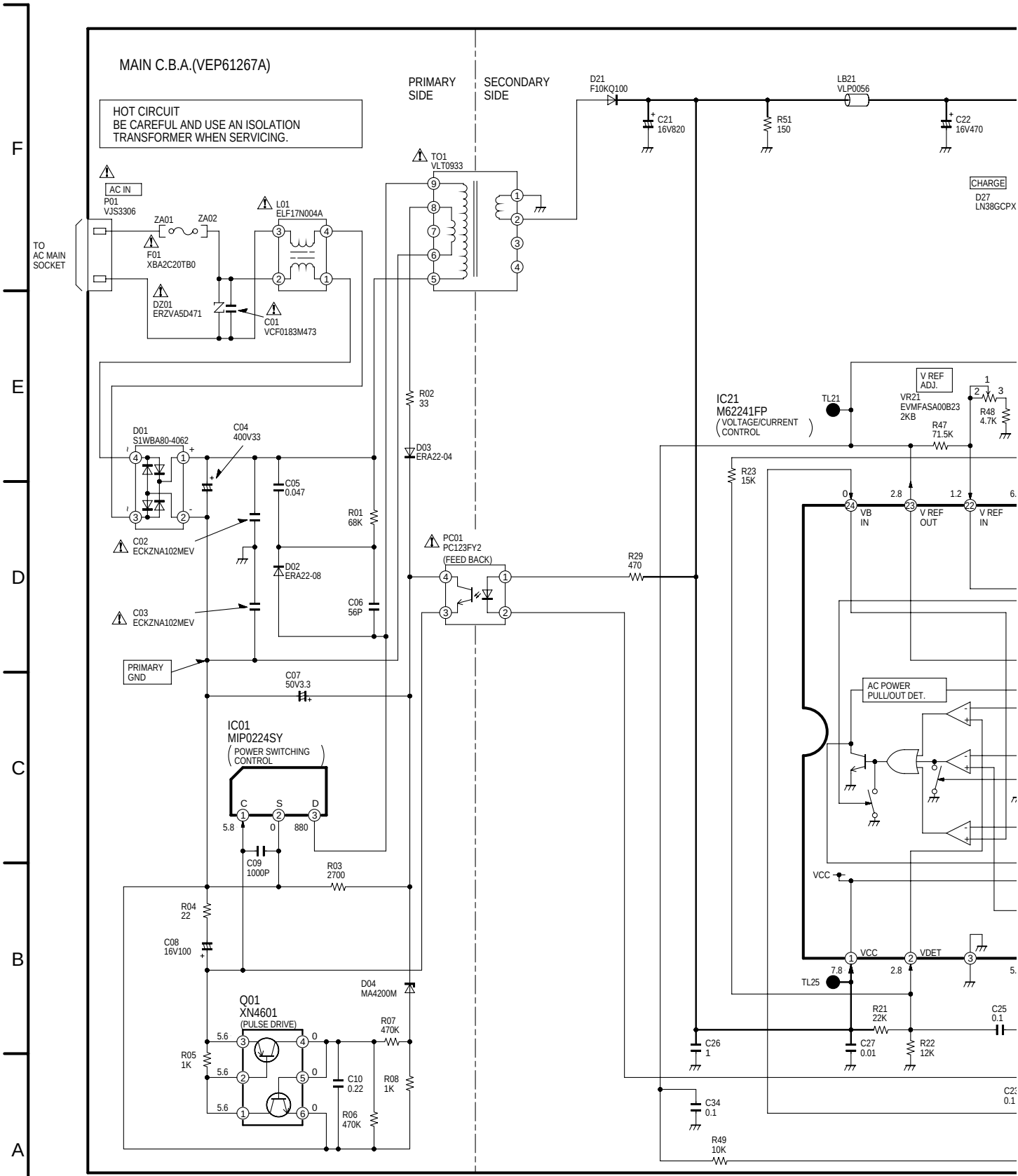
Note: 1. Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE: Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.
3. Unless otherwise specified.
All resistors are in OHMS, K=1,000 OHMS. All capacitors are in MICROFARADS (uf), P=uuF.
4. The P.C. Board units marked width "■" show below the main assembled parts.
5. The marking (RTL) indicaters the retention time is limited for this item.
After the discontinuation of this assembly in production, it will no longer be available.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
■	VEP61267A	MAIN C.B.A.		(RTL)
C01	VCF0183M473	POLYESTER FILM CAPACITOR	1	F0XAF473A002 ⚠
C02	ECKZNA102MEV	C.CAPACITOR 1000P	1	⚠
C03	ECKZNA102MEV	C.CAPACITOR 1000P	1	⚠
C04	VCEA2GAT330Y	E.CAPACITOR 400V 33U	1	
C05	ECQE2473KF	P.CAPACITOR 250V 0.047U	1	
C06	ECCZ3A560KGE	C.CAPACITOR 1KV 56P	1	
C07	ECA1HHG3R3	E.CAPACITOR 50V 3.3U	1	
C08	ECA1CHG101	E.CAPACITOR 16V 100U	1	
C09	ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	1	
C10	ECUM1C224KBN	C.CAPACITOR CH 16V 0.22U	1	F1J1C224A090
C21	EEUFA1C821	E.CAPACITOR 16V 820U	1	
C22	ECA1CHG471	E.CAPACITOR 16V 470U	1	
C23	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	1	ECJ1XB1C104K
C24	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	1	ECJ1XB1C104K
C25	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	1	ECJ1XB1C104K
C26	ECUM1C105ZFN	C.CAPACITOR CH 16V 1U	1	F1J1C105A063
C27	ECUX1H103ZFV	C.CAPACITOR CH 50V 0.01U	1	ECJ1XF1H103Z
C28	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	1	
C29	ECUX1C104KBV	C.CAPACITOR CH 16V 0.1U	1	ECJ1XB1C104K
C30	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	1	
C31	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	1	
C32	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	1	
C33	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	1	
C34	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	1	
C35	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	1	
C36	ECUM1H222JCN	C.CAPACITOR CH 50V 2200P	1	
C37	ECUX1C104ZFV	C.CAPACITOR CH 16V 0.1U	1	
C38	ECUM1C105ZFN	C.CAPACITOR CH 16V 1U	1	F1J1C105A063
D01	S1WBA80-4062	BRIDGE DIODE	1	B0EBKT000002
D02	ERA22-08	DIODE	1	B0HAGT000001
D03	ERA22-04	DIODE	1	B0HAGP000001

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
D04	MA4200M	DIODE	1	MAZ42000M
D21	F10KQ100	DIODE	1	B0JASL000001
D22	MA165	DIODE	1	MA2C165
D23	MA4120	ZENNER DIODE	1	MAZ4120
D24	MA4120	ZENNER DIODE	1	MAZ4120
D25	MA4120	ZENNER DIODE	1	MAZ4120
D26	LN28RCPX	LED (RED)	1	
D27	LN38GCPX	LED (GREEN)	1	
DZ01	ERZVA5D471	TRANSIENT/SURGE ABSORBER	1	⚠
F01	XBA2C20TB0	FUSE	1	K5D202BL0004 ⚠
IC01	MIP0224SY	IC	1	
IC21	M62241FP	IC	1	
JK21	VJP3381	DC JACK	1	K2EC2B000001
L01	ELF17N004A	LINE FILTER	1	⚠
LB21	VLP0056	FERRITE BEAD	1	J0JKB0000002
P01	VJS3306	AC INLET	1	K2AA2G000002 ⚠
P21	VEK8829	BATTERY CATCHER	1	
PC01	PC123FY2	PHOTO COUPLER	1	B3PAA0000012 ⚠
Q01	XN4601	TWIN TRANSISTOR	1	XN04601
Q21	2SA1897	TRANSISTOR	1	
R01	ERG2SJ683	M.RESISTOR 2W 68K	1	
R02	ERG2SJ330	M.RESISTOR 2W 33	1	
R03	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	
R04	ERDS2TJ220	C.RESISTOR 1/4W 22	1	
R05	ERJ6GEYG102	M.RESISTOR CH 1/10W 1K	1	
R06	ERJ6GEYJ474V	M.RESISTOR CH 1/10W 470K	1	
R07	ERJ6GEYJ474V	M.RESISTOR CH 1/10W 470K	1	
R08	ERJ6GEYG102	M.RESISTOR CH 1/10W 1K	1	
R21	ERJ3RBD223	M.RESISTOR CH 1/16W 22K	1	
R22	ERJ3RBD123	M.RESISTOR CH 1/16W 12K	1	
R23	ERJ3RBD153	M.RESISTOR CH 1/16W 15K	1	
R24	ERDS2FJ681	C.RESISTOR 1/4W 680	1	
R25	ERDS2FJ331	C.RESISTOR 1/4W 330	1	
R26	ERG2SJ151	M.RESISTOR 2W 150	1	
R27	ERDS2FJ122	C.RESISTOR 1/4W 1.2K	1	
R28	ERX1SZGR10	M.RESISTOR 1W 0.1	1	
R29	ERDS2FJ471	C.RESISTOR 1/4W 470	1	
R30	ERDS2FJ561	C.RESISTOR 1/4W 560	1	
R31	ERJ3GEYJ102	M.RESISTOR CH 1/16W 1K	1	
R32	ERJ3GEYJ152	M.RESISTOR CH 1/16W 1.5K	1	
R33	ERJ3RBD393	M.RESISTOR CH 1/16W 39K	1	
R34	ERJ3RKD1173	M.RESISTOR CH 1/16W 117K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R35	ERJ3RBD913	M.RESISTOR CH 1/16W 91K	1	
R36	ERDS2FJ472	C.RESISTOR 1/4W 4.7K	1	
R37	ERJ3RBD393	M.RESISTOR CH 1/16W 39K	1	
R38	ERJ3RKD1173	M.RESISTOR CH 1/16W 117K	1	
R39	ERJ3RBD162	M.RESISTOR CH 1/16W 1.6K	1	
R40	ERJ3RBD303	M.RESISTOR CH 1/16W 30K	1	
R41	ERJ3RBD303	M.RESISTOR CH 1/16W 30K	1	
R42	ERJ3RBD471	M.RESISTOR CH 1/16W 470	1	
R43	ERJ3RBD243	M.RESISTOR CH 1/16W 24K	1	
R44	ERJ3RBD242	M.RESISTOR CH 1/16W 2.4K	1	
R45	ERJ3RBD512	M.RESISTOR CH 1/16W 5.1K	1	
R46	ERJ3RBD273	M.RESISTOR CH 1/16W 27K	1	
R47	ERJ3RBD752	M.RESISTOR CH 1/16W 7.5K	1	
R48	ERJ3GEYJ472	M.RESISTOR CH 1/16W 4.7K	1	
R49	ERJ3RBD103	M.RESISTOR CH 1/16W 10K	1	
R50	ERJ3GEYJ472	M.RESISTOR CH 1/16W 4.7K	1	
R51	ERG2SJ151	M.RESISTOR 2W 150	1	
R52	ERJ3GEYJ471	M.RESISTOR CH 1/16W 470	1	
T01	VLT0933	TRANSFORMER	1	ETS24KC116AG ⚠
VR21	EVMEASA00B23	V.RESISTOR	1	
		MISCELLANEOUS		
	VSC4845	HEAT SINK 1	1	
	VSC4846	HEAT SINK 2	1	
	XTB26+6J	SCREW	2	

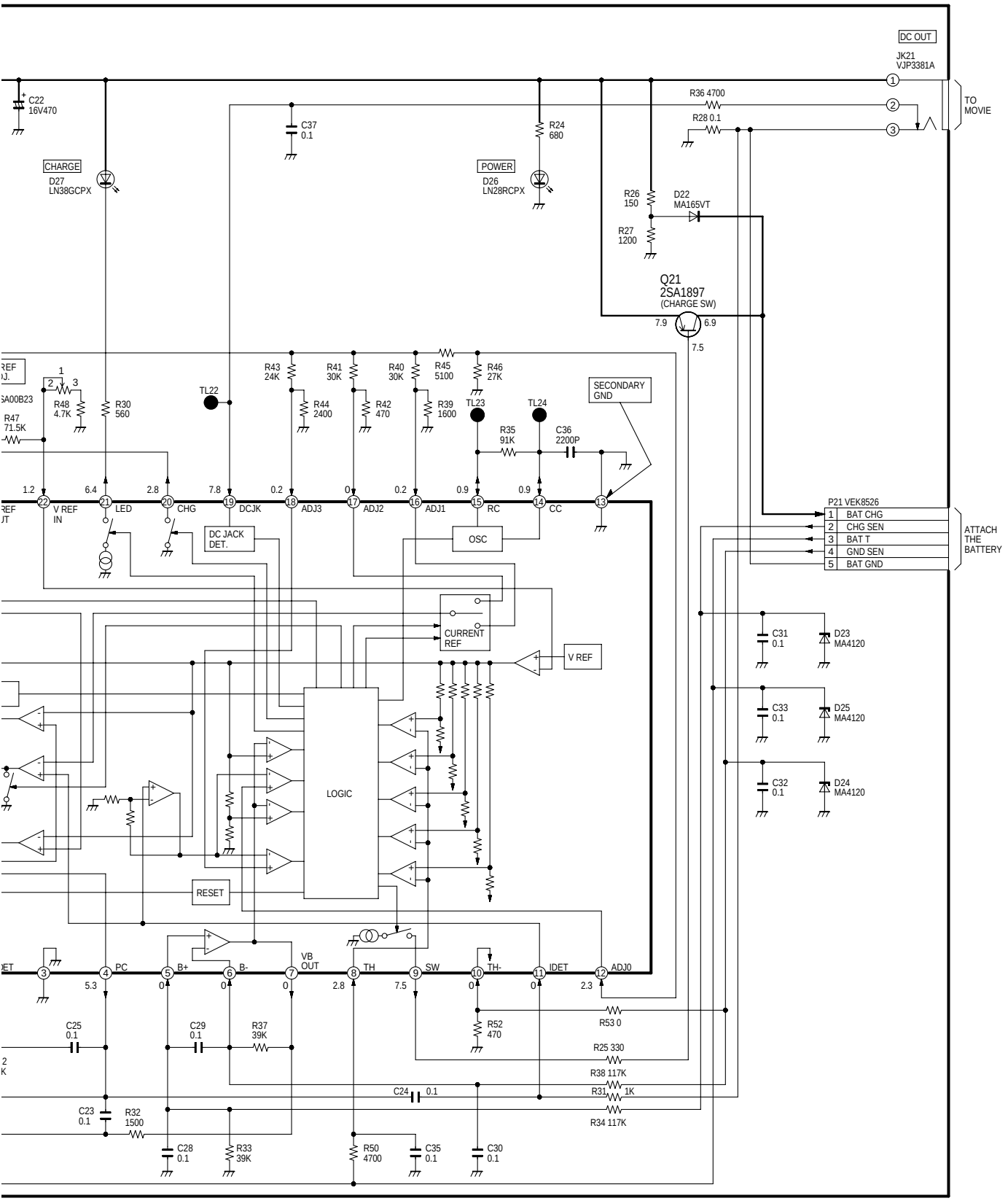
5. SCHEMATIC DIAGRAM FOR PRINTING WITH A4 SIZE



IMPORTANT SAFETY NOTES:
COMPONENT IDENTIFIED THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.WHEN REPLACING OF THESE COMPONENTS,USE ONLY THE SAME TYPE.

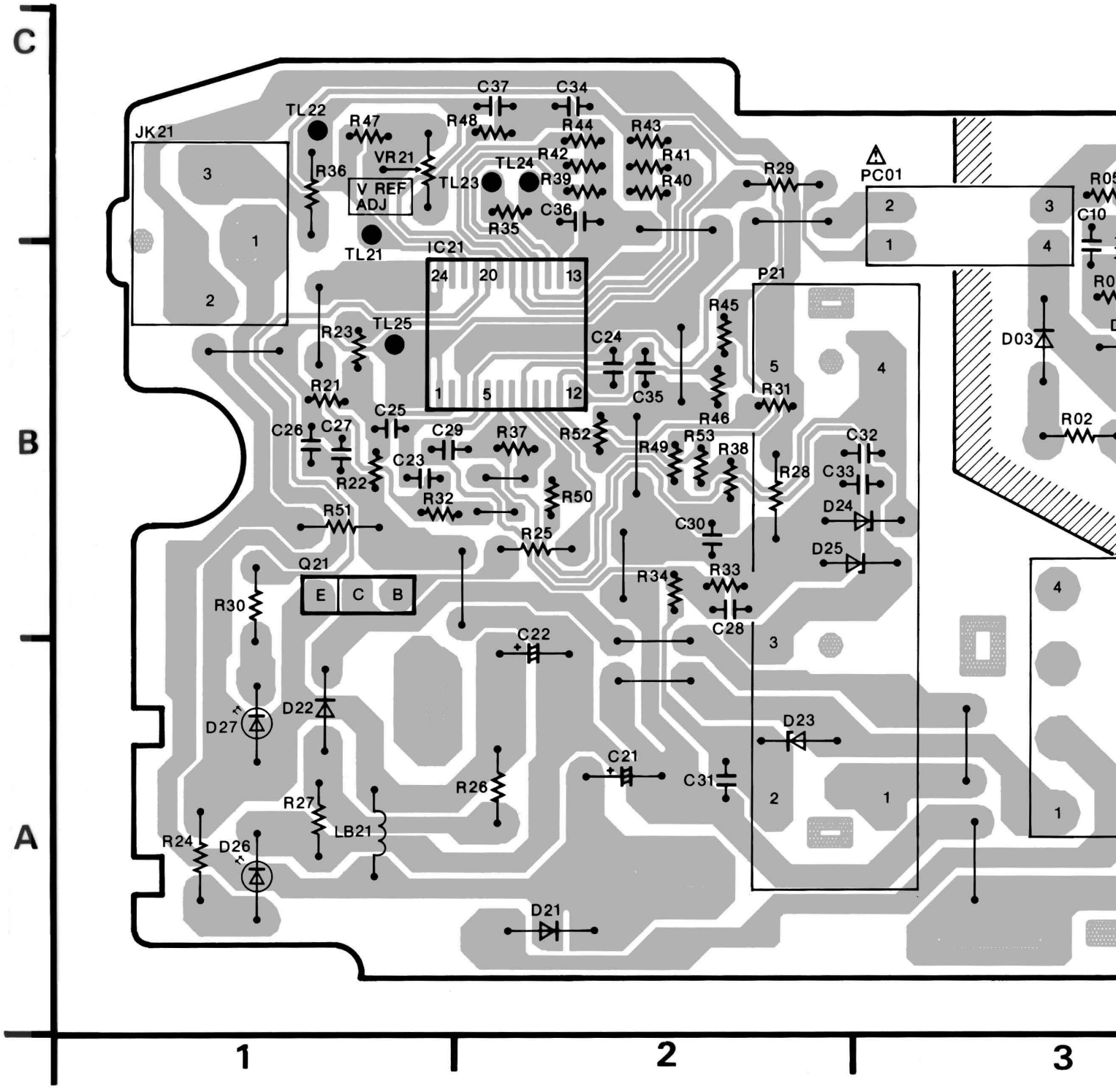
NOTE1:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

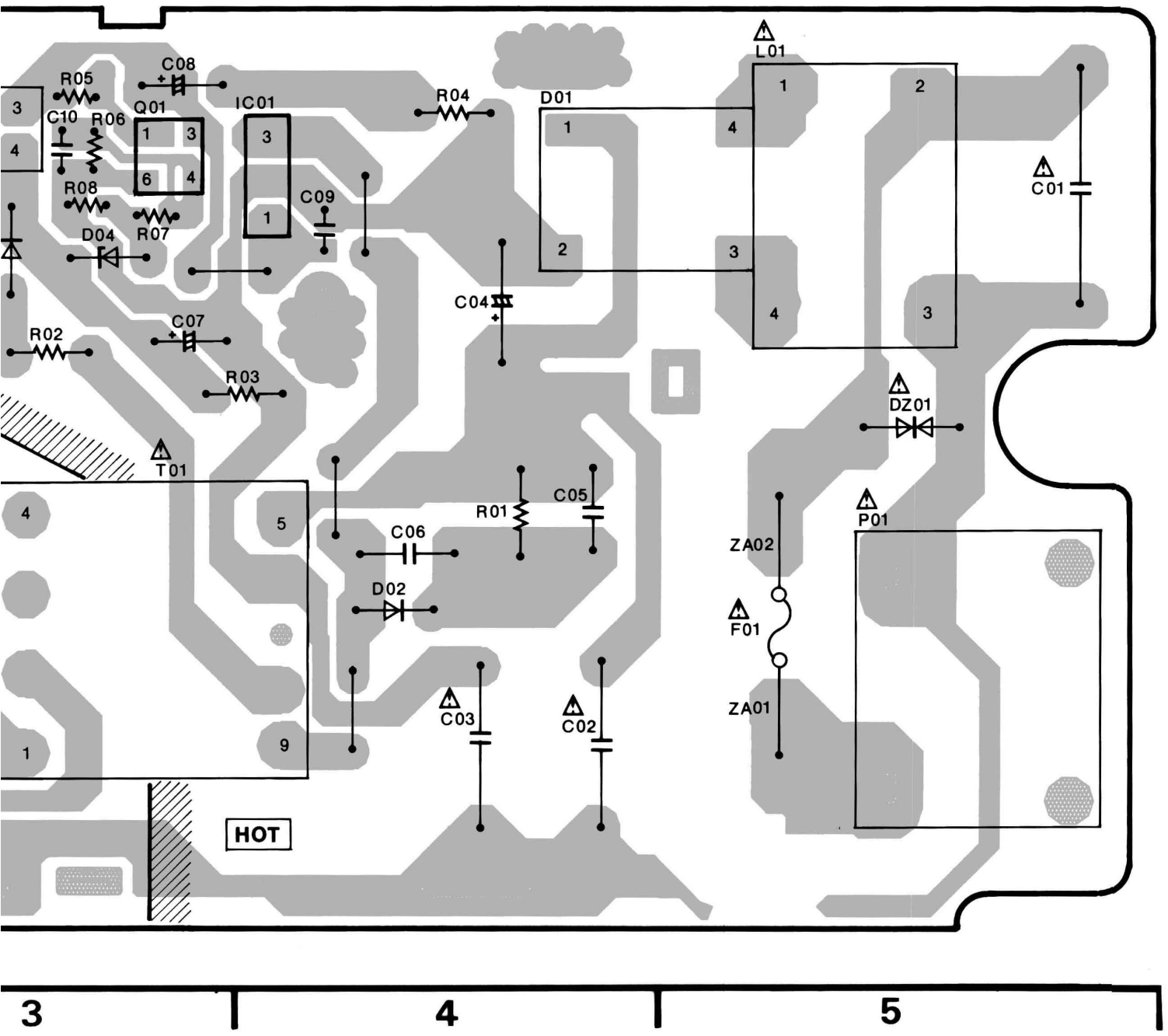
NOTE2:WHEN MEASURE THE DC VOLTAGE AN
PRIMARY SIDE.....IC01-2 PIN OF THE M
SECONDARY SIDE....IC21-13 PIN OF TH



E DC VOLTAGE AND WAVEFORM,CONNECT THE GND READ OR GND PROBE TO NEXT GND.
)1-2 PIN OF THE MAIN C.B.A.(PRIMARY GND).
IC21-13 PIN OF THE MAIN C.B.A.(SECONDARY GND).

NOTE3:THE DC VOLTAGE INDICATED IN PRIMARY SIDE
IS MEASURE WHEN INPUT AC 220V IS SAPPLIED.
NOTE4:WHEN MEASURE THE DC VOLTAGE,CONNECT THE
MOVIE TO DC OUTPUT(JK21).


C
B
A
1
2
3
JK21
TL22
R47
C37
C34
R48
R44
R43
R42
R41
VR21
TL24
R39
R40
R36
V REF ADJ
TL23
R35
C36
TL21
IC21
24
20
13
1
5
12
R29
PC01
P21
R45
TL25
R23
C24
C35
R46
R31
R21
C25
C26
C27
C29
R37
R52
R49
R53
R38
C32
C33
R22
C23
R32
R50
R28
D24
R51
C30
R25
D25
Q21
E
C
B
R30
R34
R33
C28
C22
D22
D27
D23
C21
C31
R26
R27
LB21
R24
D26
D21
D03
R02
C10


L01
C08
R05
C10
R06
Q01
IC01
R04
D01
C01
R08
R07
C09
D04
C04
R02
C07
R03
DZ01
T01
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C05
P01
C06
ZA02
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F01
ZA01
C03
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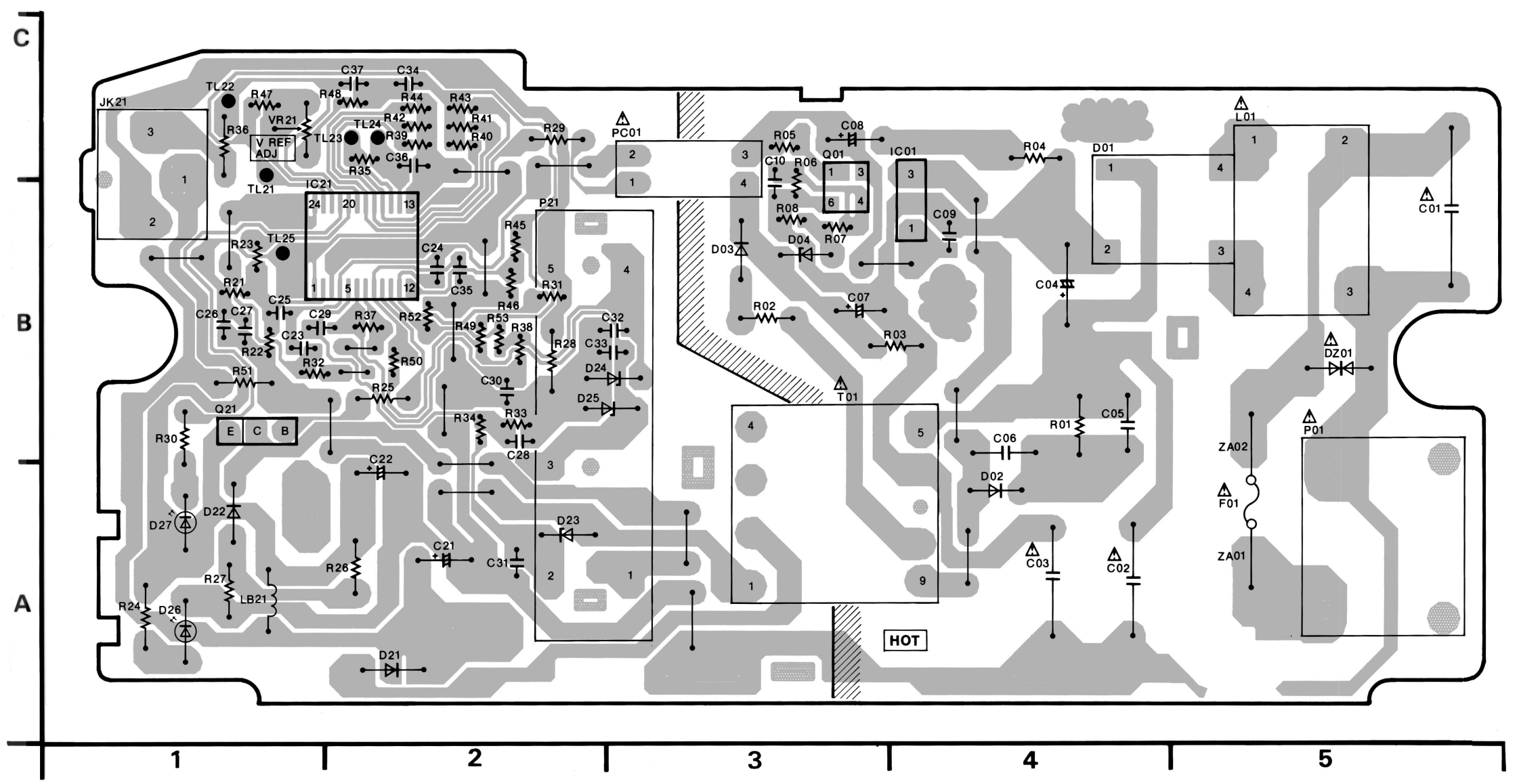
C
B
A
1
2
3
4
5
JK21
TL22
R47
R48
C37
C34
R43
R44
R42
R41
R40
R39
C36
R35
TL24
TL23
VR21
V REF ADJ
TL21
R36
R29
PC01
R05
C08
C10
R06
Q01
IC01
R04
D01
L01
C01
R08
R07
D04
D03
C09
IC21
P21
TL25
R23
C24
C35
R45
R46
R31
C04
R21
C25
C26
C27
C29
R37
R52
R49
R53
R38
C32
C33
R28
C23
R22
R32
R50
D24
D25
R51
R25
C30
T01
DZ01
Q21
E
C
B
R30
R34
R33
C28
C22
R01
C05
C06
D02
P01
ZA02
F01
ZA01
D22
D27
D23
C21
C31
R26
R27
LB21
C03
C02
R24
D26
D21
HOT

MAIN C.B.A.(VEP61267A)

HOT CIRCUIT
BE CAREFUL AND USE AN ISOLATION TRANSFORMER WHEN SERVICING.

PRIMARY SIDE

SECONDARY SIDE

AC IN
P01 VJS3306
TO AC MAIN SOCKET
ZA01
ZA02
F01 XBA2C20TB0
L01 ELF17N004A
DZ01 ERZVA5D471
C01 VCF0183M473

TO1 VLT0933

D01 S1WBA80-4062
C04 400V33
C05 0.047
C02 ECKZNA102MEV
C03 ECKZNA102MEV
D02 ERA22-08
C06 56P
R01 68K
PRIMARY GND
C07 50V3.3

R02 33
D03 ERA22-04

PC01 PC123FY2 (FEED BACK)
R29 470

IC01 MIP0224SY (POWER SWITCHING CONTROL)
C C09 1000P
S
D R03 2700
5.8
0
880

R04 22
C08 16V100

D04 MA4200M

Q01 XN4601 (PULSE DRIVE)
R07 470K
R05 1K
R08 1K
C10 0.22
R06 470K

D21 F10KQ100
C21 16V820
R51 150
LB21 VLP0056
C22 16V470

CHARGE
D27 LN38GCPX

C37 0.1

POWER
D26 LN28RCPX
R24 680

DC OUT
JK21 VJP3381A
TO MOVIE
R36 4700
R28 0.1
R26 150
D22 MA165VT
R27 1200

Q21 2SA1897 (CHARGE SW)
7.9
6.9
7.5

IC21 M62241FP (VOLTAGE/CURRENT CONTROL)

TL21
V REF ADJ.
VR21 EVMFASA00B23 2KB
R48 4.7K
R47 71.5K
R30 560

TL22
R43 24K
R41 30K
R40 30K
R45 5100
R46 27K
R44 2400
R42 470
R39 1600
TL23
TL24
R35 91K
C36 2200P
SECONDARY GND

R23 15K

24	23	22	21	20	19	18	17	16	15	14	13												
0	2.8	1.2	6.4	2.8	7.8	0.2	0	0.2	0.9	0.9													
VB IN	V REF OUT	V REF IN	LED	CHG	DCJK	ADJ3	ADJ2	ADJ1	RC	CC													

DC JACK DET.
OSC
CURRENT REF
V REF
AC POWER PULL/OUT DET.
LOGIC
RESET
VCC

1	2	3	4	5	6	7	8	9	10	11	12												
7.8	2.8		5.3	0	0	0	2.8	7.5	0	0	2.3												
VCC	VDET		PC	B+	B-	VB OUT	TH	SW	TH-	IDET	ADJ0												

TL25

R21 22K
C27 0.01
R22 12K
C25 0.1
C29 0.1
R37 39K
C26 1
C34 0.1
R49 10K
C23 0.1
R32 1500
C28 0.1
R33 39K
R50 4700
C35 0.1
C30 0.1
C24 0.1
R52 470
R53 0
R25 330
R38 117K
R31 1K
R34 117K

P21 VEK8526
1 BAT CHG
2 CHG SEN
3 BAT T
4 GND SEN
5 BAT GND
ATTACH THE BATTERY

C31 0.1
D23 MA4120
C33 0.1
D25 MA4120
C32 0.1
D24 MA4120

IMPORTANT SAFETY NOTES:
COMPONENT IDENTIFIED THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.WHEN REPLACING OF THESE COMPONENTS,USE ONLY THE SAME TYPE.

NOTE1:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

NOTE2:WHEN MEASURE THE DC VOLTAGE AND WAVEFORM,CONNECT THE GND READ OR GND PROBE TO NEXT GND.
PRIMARY SIDE.....IC01-2 PIN OF THE MAIN C.B.A.(PRIMARY GND).
SECONDARY SIDE....IC21-13 PIN OF THE MAIN C.B.A.(SECONDARY GND).

NOTE3:THE DC VOLTAGE INDICATED IN PRIMARY SIDE IS MEASURE WHEN INPUT AC 220V IS SAPPLIED.
NOTE4:WHEN MEASURE THE DC VOLTAGE,CONNECT THE MOVIE TO DC OUTPUT(JK21).

F E D C B A

1 2 3 4 5 6 7 8 9 10